

Abstract

Rapid shaft stop devices and transmissions are described that utilize permanent magnets for coupling and/or braking. In an embodiment, one or more capacitive discharge pulses are used to rapidly stop a propeller. A magnetic transmission is provided having axially oriented magnets on each side of an air space junction that transmit torque across the junction with a torque/speed profile that particularly suits boat propellers. The junction may include a bearing and allows slippage when the propeller resistance exceeds a given value. This slippage acts as a variable gear reduction. One or more electromagnets may be energized and thereby add to or subtract from one or more magnetic fields and provide electronic control of torque and of gear reduction ratio. The device allows a boater the use of a wider variety of propellers at higher efficiency, provides higher boating speed, minimizes cavitation, and makes possible rapid propeller shut off when used in combination with other components of an electronic propeller guard system.